

### **ABSTRACT**

A metal sulfide based non-volatile memory device is provided herein. The device is comprised of a substrate, a backplane, a planar memory media including a dense array of metal sulfide based memory cells, and a MEMS probe based actuator.

5 The cells of the memory device are operative to be of two or more states corresponding to various levels of impedance. The MEMS actuator is operable to position micro/nano probes over the appropriate cells to enable reading, writing, and erasing the memory cells by applying a bias voltage.